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EXAMINER	
CRAWLEY, KEITH L	
ART UNIT	PAPER NUMBER
4193	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,644	JOHNSON ET AL.	
	Examiner	Art Unit	
	KEITH CRAWLEY	4193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-18 and 20-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-18 and 20-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-11, 13-18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Zehner et al. (US 7,012,600).

Regarding claim 1, Zehner discloses An electrophoretic display panel, comprising: an electrophoretic medium comprising charged particles (col. 1, line 30-35, the invention relates to bistable electro-optic displays, especially electrophoretic displays); a plurality of picture elements (col. 6, line 22 "plurality of pixels"); electrodes associated with each picture element for receiving a potential difference (col. 15, line 25-40 explains the active matrix display architecture); and drive means (see fig. 2,

column drivers 24 and row drivers 22), the drive means being arranged for controlling the potential difference of each picture element to be a grey scale potential difference for enabling the particles to be driven to a position corresponding to the image information from a preceding optical state (col. 5, line 24-26 and more specifically, col. 6, line 20-38, the "look-up table method", see also col. 7, line 7-23, controller is arranged to output a signal representative of impulse required to change pixel from initial to final state), wherein the drive means are further arranged for application of the grey scale potential difference for at least a subset of all drive waveforms (col. 7, line 39-41, the "look-up table method" in which the output signal represents a plurality of pulses, see also col. 10, line 15-27, the use of "sub-scan periods" for the relevant grey scale transition) for setting a picture element from a preceding optical state to a grey scale in two or more pulses (col. 7, line 39-41 the use of a plurality of pulses discussed above, see also col. 10 line 15-27, the use of "double-prepulse waveforms") which change the optical state of the system separated by a non-zero time interval (see table 2, as well as col. 21 line 47-51, "sequence of impulses designed to accomplish an image transition") and are arranged for prior to application of the grey scale potential difference, driving a reset potential difference of each picture element (see fig. 8, reset pulse 304 is prior to the write image step 306) to drive the particles to occupy an extreme position (col. 26, line 9-11, reset step 304 drives pixels to extreme white or black states) which is determined based on which extreme position is closest to a position of the particles which corresponds to the image information (col. 30, line 56-59, the display can be divided into two or more groups and different reset pulses [namely

driving to either white or black] can be applied to the different groups, see also col. 31, line 34-38, "the pixels may be divided into groups which use different reset steps differing in number and frequency of pulses).

Regarding claim 2, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for, during the non-zero time interval, applying a voltage value below a threshold voltage value below which the particles remain substantially in their position (col. 14, line 37-40, the voltage applied is close to zero when there are no pixels undergoing transitions, also see col. 9 line 31-33 and col. 12, line 61-65 describing the "zero transition").

Regarding claim 3, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for, during the non-zero time interval, applying a voltage value of substantially zero (col. 14, line 37-40, the voltage applied is zero when there are no pixels undergoing transitions, also see col. 9 line 31-33 and col. 12, line 61-65 describing the "zero transition")

Regarding claim 4, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for controlling the potential difference of each picture element to be a reset potential difference (see fig. 8, reset pulse 304) having a reset value and a reset duration (col. 30, line 47-52, "number and duration of reset pulses can be varied") for enabling particles to substantially occupy one of the

extreme optical positions (col. 30, second paragraph describes in detail a particular implementation of a reset pulse scheme).

Regarding claim 5, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are further arranged for application of the grey scale potential difference over more than two pulses (see table 2, as well as col. 21, line 47-51, the impulses described "may be part of a sequence of impulses").

Regarding claim 6, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are further arranged for application of the grey scale potential difference in two pulses (again see table 2, as well as col. 21, line 47-51, as well as col. 10, line 15-17, specifically mentioning "double-prepulse waveforms").

Regarding claim 7, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for application of the grey scale potential difference in two or more pulses (see above) wherein the applied pulses have decreasing time duration as the driving time increases (col. 21, line 60-67, specifically "gray states can be obtained by modulating the length of the voltage pulse applied to the display", see also col. 7 line 39-42, and see fig. 6).

Regarding claim 8, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for application of the grey scale

potential difference in two or more pulses (see above) wherein the applied pulses have decreasing amplitude as the driving time increases (col. 21, line 60-67, specifically "gray states can be obtained by... modulating the applied voltage", see also col. 7 line 39-42, and see fig. 6).

Regarding claim 9, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are arranged for application of the grey scale potential difference in more than two pulses (see above), the pulses are separated by at least two non-zero time intervals, and the time intervals increase as the driving time increases (same rationale as above, combined with col. 22, line 19-25, specifically "the effective resolution can be increased by imposing a nonlinear spacing of the voltage steps", thus the time intervals can increase as the driving time increases).

Regarding claim 10, Zehner discloses the electrophoretic display panel as claimed in claim 1, wherein the drive means are further arranged to control for each picture element the potential difference to be a sequence of preset potential differences before being the grey scale potential difference (col. 28, line 17-25, namely the other pulses (defined as the first pulse and the intervening pulses) are defined as prepulses to the writing pulse), the sequence of preset potential differences having preset values and associated preset durations (col. 28, line 23, the so-called "prepulse slide show waveforms", determined by the "look-up table method" referenced above), the preset values in the sequence alternating in sign (col. 28, line 44-47, pairs of pulses are

described which are typically of equal impulse and opposite polarity), each preset potential difference representing a preset energy sufficient to release particles present in one of said extreme positions from their position but insufficient to enable said particles to reach the other one of the extreme positions (col. 28, line 44-47, numerous impulses of varying energy may be used, examples are given in the disclosure).

Regarding claim 11, Zehner discloses a method for driving an electrophoretic display device comprising: an electrophoretic medium comprising charged particles (col. 1, line 30-35, the invention relates to bistable electro-optic displays, especially electrophoretic displays); a plurality of picture elements (col. 15, line 25-40 explains the active matrix display architecture), the method comprising acts of: applying grey scale potential differences for setting a picture element to an optical state from a preceding optical state for at least a subset of all drive waveforms (col. 5, line 24-26 and more specifically, col. 6, line 20-38, the "look-up table method", see also col. 7, line 39-41, the "look-up table method" in which the output signal represents a plurality of pulses, see also col. 10, line 15-27, the use of "sub-scan periods" for the relevant grey scale transition) in two or more pulses (col. 7, line 39-41 the use of a plurality of pulses discussed above, see also col. 10 line 15-27, the use of "double-prepulse waveforms") separated by a non-zero time interval (see table 2, as well as col. 21 line 47-51, "sequence of impulses designed to accomplish an image transition"); and prior to application of the grey scale potential difference, applying a reset potential difference of each picture element (see fig. 8, reset pulse 304 is prior to the write image step 306) to

drive the particles to occupy an extreme position (col. 26, line 9-11, reset step 304 drives pixels to extreme white or black states) which is determined based on which extreme position is closest to a position of the particles which corresponds to the optical state (col. 30, line 56-59, the display can be divided into two or more groups and different reset pulses [namely driving to either white or black] can be applied to the different groups, see also col. 31, line 34-38, "the pixels may be divided into groups which use different reset steps differing in number and frequency of pulses).

Regarding claim 13, this claim is rejected under the same rationale as claim 5.

Regarding claim 14, this claim is rejected under the same rationale as claim 6.

Regarding claim 15, this claim is rejected under the same rationale as claim 9.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, Zehner discloses a computer program comprising program code for performing the method as claimed in claim 11 when said program is executed on a computer (fig 8 is described as a flow chart illustrating a program which may be run by the controller unit, see also col. 13, line 11-13 and line 38-39, explaining how the method could be practiced on a computer in conjunction with appropriate equipment, as well as implemented in software or incorporated as a part of a CPU).

Regarding claim 18, Zehner discloses a computer program product comprising program code stored on a computer readable medium (col. 13, line 43-44 explains that the look-up table(s) are stored in memory accessible to the controller) for performing the method as claimed in claim 11 when said program is executed on a computer (fig 8 is described as a flow chart illustrating a program which may be run by the controller unit, see also col. 13, line 11-13 and line 38-39, explaining how the method could be practiced on a computer in conjunction with appropriate equipment, as well as implemented in software or incorporated as a part of a CPU).

Regarding claim 20, Zehner discloses drive means (see fig. 2, column drivers 24 and row drivers 22) for driving an electrophoretic display panel, said display panel comprising: an electrophoretic medium comprising charged particles (col. 1, line 30-35, the invention relates to bistable electro-optic displays, especially electrophoretic displays); a plurality of picture elements (col. 6, line 22 "plurality of pixels"); electrodes associated with each picture element for receiving a potential difference (col. 15, line 25-40 explains the active matrix display architecture); said drive means being arranged for controlling the potential difference of each picture element to be a grey scale potential difference for enabling the particles to occupy the position corresponding to the image information (col. 5, line 24-26 and more specifically, col. 6, line 20-38, the "look-up table method"), said drive means being further arranged for application of the grey scale potential difference for at least a subset of all drive waveforms (col. 7, line 39-41,

the "look-up table method" in which the output signal represents a plurality of pulses, see also col. 10, line 15-27, the use of "sub-scan periods" for the relevant grey scale transition) for setting a picture element from a preceding optical state to a grey scale in two or more pulses (col. 7, line 39-41 the use of a plurality of pulses discussed above, see also col. 10 line 15-27, the use of "double-prepulse waveforms") which change the optical state of the system separated by a non-zero time interval (see table 2, as well as col. 21 line 47-51, "sequence of impulses designed to accomplish an image transition") and are arranged for prior to application of the grey scale potential difference, driving a reset potential difference of each picture element (see fig. 8, reset pulse 304 is prior to the write image step 306) to drive the particles to occupy an extreme position (col. 26, line 9-11, reset step 304 drives pixels to extreme white or black states) which is determined based on which extreme position is closest to a position of the particles which corresponds to the grey scale (col. 30, line 56-59, the display can be divided into two or more groups and different reset pulses [namely driving to either white or black] can be applied to the different groups, see also col. 31, line 34-38, "the pixels may be divided into groups which use different reset steps differing in number and frequency of pulses).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zehner in view of Amundson et al. (US 7,176,880).

Regarding claim 21, Zehner fails to disclose a plurality of additional capacitors, at least one additional capacitor being connected to each picture element and to one or more storage capacitor lines.

Amundson teaches a plurality of additional capacitors (fig. 3B, storage capacitor 92', see also col. 1, line 19-21, a capacitor is at each pixel electrode), at least one additional capacitor being connected to each picture element and to one or more storage capacitor lines (col. 1, line 19-21, a capacitor is at each pixel electrode, see col. 6, line 44-46 as well as fig. 3B, capacitor 92' is connected to conductive line 16).

Zehner and Amundson are both directed to systems and methods for addressing an electrophoretic display. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the electrophoretic display of Zehner with the storage capacitor of Amundson since such a modification improves the appearance and addressing characteristics of an electronically driven display (Amundson, abstract) and can increase the voltage decay time (Amundson, col. 6, line 57-58).

Regarding claim 22, this claim is rejected under the same rationale as claim 21.

Response to Arguments

The rejection of claims 17 and 19 under 35 U.S.C. 101 as being directed to non-statutory subject matter is withdrawn in light of the cancellation of claim 19 and the amendment of claim 17 to comply with the statute.

6. Applicant's arguments filed February 18, 2009 have been fully considered but they are not persuasive. Applicant argues that Zehner does not disclose or suggest a display panel that comprises "drive means, the drive means being arranged for controlling the potential difference of each picture element to be a grey scale potential difference for enabling the particles to be driven to a position corresponding to the image information from a preceding optical state, wherein the drive means are further arranged for application of the grey scale potential difference for at least a subset of all drive waveforms for setting a picture element from a preceding optical state to a grey scale in two or more pulses which change the optical state of the system separated by a non-zero time interval and are arranged for prior to application of the grey scale potential difference, driving a reset potential difference of each picture element to drive the particles to occupy an extreme position which is determined based on which extreme position is closest to a position of the particles which corresponds to the image information" as recited in claim 1, and similarly recited in claims 11 and 20. The examiner respectfully disagrees with the above arguments for the reasons and citations listed in the above rejection of claims 1, 11, and 20.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH CRAWLEY whose telephone number is (571)270-7616. The examiner can normally be reached on M-F, 7:30-5:00 EST, alternate Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derris Banks can be reached on (571)272-4419. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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